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LETTER AND U S EPA REGION I COMMENTS ON DRAFT FINAL FEASIBILITY STUDY FOR
DECISION UNIT 5-1 SITES 13 TANK FARM 5 NS NEWPORT RI
10/7/2012
U S EPA REGION I



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION I

5 Post Office Square, Suite 100
Boston, MA 02109-3912

October 7, 2012

Mr. Roberto Pagtalunan
NAVFAC MIDLANT (Code OPNEEV)
Environmental Restoration
Building Z-144, Room 109
9742 Maryland Avenue
Norfolk, VA 23511-3095

Re: Draft Final Feasibility Study for Decision Unit 5-1 at Site 13, Tank Farm 5

Dear Mr. Pagtalunan:

Thank you for the opportunity to review the *Draft Final Feasibility Study for Decision Unit 5-1 at Site 13, Tank Farm 5* dated September 2012 (referred to as the FS). The FS presents the development and evaluation of remedial alternatives to mitigate unacceptable human risk associated with chemicals of concern in soil and groundwater at Tank Farm 5. Detailed comments are provided in Attachment A.

This FS speculates that the cause for the elevated metals concentrations in the groundwater at DU 5-1 may be related to the release of petroleum at the upgradient storage tanks. While this is reasonable, the four groundwater monitoring wells existing at DU 5-1 are all located at or adjacent to the oil-water separator or its discharge piping. The presumption that all or a significant portion of the groundwater at DU 5-1 is impacted to the same degree as at the existing monitoring wells has not been demonstrated because no monitoring wells exist in locations that would not have been impacted by the activities and releases that occurred at DU 5-1. As a result, the Navy has not demonstrated that plumes do not exist, contrary to the discussion in this FS that states that no definable groundwater plume exists. As a result, it is not clear that active groundwater remediation at the locations where PRGs are exceeded would not be an effective remedial strategy. EPA suggests the installation of groundwater monitoring wells upgradient of the impacted wells in DU 5-1 to determine whether the groundwater contamination is migrating into DU 5-1 and not a result of the releases specific to DU 5-1.

As discussed at the May 16, 2012 RPM meeting, the Navy needs to follow up with a letter to describe how contamination along the fence lines will be addressed if it is not discussed in the Draft Final FS. It was EPA's understanding that the Navy was going to request that the fence line contamination be added as a separate site under the FFA instead of addressing it in the Tank Farm 5 FS.

The only groundwater remedial action proposed is Monitored Natural Attenuation (MNA). No supporting information has been provided in the FS about the effectiveness of MNA or the timeframe that will be required for MNA to achieve the remedial goals as was required by EPA and discussed at numerous meetings. Further, as also previously requested by EPA, no contingency plan or alternative has been presented in the event that MNA is not successful. EPA recommends that *in situ* treatment to modify groundwater geochemistry be included as an alternative retained for detailed analysis - particularly because the Navy is unable to justify the selection of MNA as a reasonably appropriate remedy for DU 5-1 based on currently available data.

Please describe how the Navy will enforce the restricted recreational use in the FS. Other than requiring a permit for bow hunting, no discussion is included in the FS describing how casual recreational users would be denied access to the site.

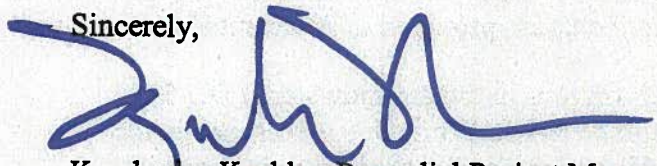
Insert a figure that presents the groundwater elevation contours and flow direction at DU 5-1 using the latest available data.

Soil samples collected during the 2004-2006 removal action exceeded the arsenic PRG in samples collected around the former oil-water separator and at the most upgradient soil sample collected from the discharge pipe excavation. The RIDEM industrial DEC for benzo(a)pyrene was also exceeded at downgradient soil location TF5-OW-Discharge 14 in the former pipeline excavation and dioxin TECs were exceeded in several soil samples from the discharge pipe excavation. While these areas are addressed by the proposed proactive soil alternatives, the data were not considered when the risk assessment was developed.

EPA notes that comment SC2 for page ES-2 from our April 13, 2012 letter (regarding the use of CTE in decision-making process and use of background values) has not been addressed in this draft final document.

I look forward to working with you and the Rhode Island Department of Environmental Management to select a final remedy for Tank Farm 5. Please contact me at (617) 918-1385 to arrange a meeting.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kymberlee Keckler', with a stylized flourish at the end.

Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Pamela Crump, RIDEM, Providence, RI
Deb Moore, NETC, Newport, RI
David Peterson, USEPA, Boston, MA
Steven Parker, Tetra Tech-NUS, Wilmington, MA

ATTACHMENT A

<u>Page</u>	<u>Comment</u>
p. ES-3	See general comment concerning the addition of an active treatment alternative for groundwater. Add to the text of GW-2: "Monitored natural attenuation and land use controls to prevent residential use of groundwater until groundwater cleanup standards are achieved – \$724,656."
p. 1-2, ¶1	In the second sentence, change "and exceedances of chemical-specific ARARs" to "exceedances of chemical-specific ARARs, and background levels of contaminants within the site as part of the risk management process. "
p. 1-7, 2 nd bullet	Specify the contaminants and whether the removal action was done under CERCLA or under State authority. If under CERCLA, specify whether all contaminated soil that posed a CERCLA risk was removed or if contaminants were left in place.
p. 1-7, ¶2	Specify what contaminants were removed as part of the removal action noted here and whether it was the removal action was done under CERCLA or under State authority. If under CERCLA, specify whether all contaminated soil that posed a CERCLA risk removed or if contaminants were left in place.
p. 1-11, §1.6	Specify whether there is any freshwater or coastal floodplain habitat within the OU.
p. 1-14, ¶1	In the second sentence, describe whether the levels of dioxin/furan were compared to EPA's revised standards for these contaminants.
p. 1-14, §3	In the third sentence, identify whether arsenic found within the OU exceeds approved background levels (and identify the background level). In the fifth sentence, identify the background chromium concentration.
p. 1-16, ¶2	In the last sentence, although there were no exceedances of federal MCLs, also list whether there were any exceedances of federal MCLGs, federal risk-based standards, or more stringent state groundwater standards.
p. 2-3, §2.1.4.1	Please correct the last two sentences. Industrial DEC's are limited to the top two feet of soil only if a land use control prevents industrial exposure to deeper soil. Leachability criteria apply above the seasonal high groundwater elevation.
p. 2-4, ¶1	Remove the second sentence, since the State's groundwater classification regulations are not an ARAR. Instead, state that the groundwater is classified as potable water source under federal standards.
p. 2-5, ¶4	In the second sentence replace "applicable" with "relevant and appropriate." In the third sentence remove "In accordance with agreements between RIDEM, EPA and the Navy" and start the sentence with "The RIDEM DEC's."
p. 2-5, ¶7	In the first sentence, replace "balanced by comparison" with "adjusted so that they don't exceed."

- p. 2-9, §2.2.2 In the last paragraph, the text states that *this approach ensures that the HI from each target organ will be less than 1.0* given that the individual HQs will be less than 1.0 when there are fewer than ten COCs. If some of the COCs affect the same target organ, this would not be true. Please revise the sentence to "...and that the HI affecting each same target organ will be less than 1.0."
- p. 2-9, §2.2.3 The most recent RIDEM regulations are dated November 2011, not February 2004. Please correct throughout the document.
- The third last sentence is irrelevant as stated. Potential future residential use of the site must be accounted for by defining where land use controls are required and residential PRGs are required to do that. Please revise this sentence.
- p. 2-9, ¶6 Replace the last sentence that continues onto page 2-10 with: "Background concentrations may be set as PRGs for inorganic compounds if approved background concentrations are established for the site, based on EPA guidance."
- p. 2-10, ¶6 The background values appear to be based on all four soil types rather than the two soil types present at DU 5-1. The background values need to be recalculated based on the soil types present at DU 5-1.
- p. 2-12, ¶1 Change the last sentence to: "Therefore, no remedial measures to address arsenic in groundwater are required under CERCLA."
- p. 2-12, ¶3 Remove this paragraph as the text is not relevant and the issue is whether cobalt in the groundwater exceeds risk or ARAR based standards.
- p. 2-14, ¶3 Remove the last sentence, concerning whether manganese alone can be used to require a remedial action.
- p. 2-15 Add another Soil RAO to prevent future migration of soil contaminants either to groundwater or adjacent wetlands/waterways.
- p. 2-16, 1st bullet Before "PRGs" insert "federal drinking water standards, risk-based standards, and more stringent state groundwater standards; identified exceedances of these standards are the"
- p. 2-16 Add another Groundwater RAO to restore the aquifer to potable drinking water standards.
- p. 2-17, §2.4.1 In the discussion of soil quantities, please clarify that surface soil is the 0-1 foot interval if that is what is intended.
- p. 2-17, ¶3 The third sentence is not accurate because if soil exceeding the IC/DECs is below 2 feet, institutional controls are still required to ensure that a 2 foot cover of clean substrate remains over the contaminated soil. As a result, an area and volume of contaminated soil that exceeds the IC/DECs and therefore requires a cover needs to be calculated.
- p. 2-17, §2.4.2 There may be no identified source for groundwater COCs only because of the limited investigation conducted to date. It is possible that releases at the oil-water separator and along the oil-water separator discharge line are responsible for the groundwater

contamination detected. The Navy has not developed a sufficient groundwater database to reject this conceptual site model.

- p. 3-10, §3.3.2 The last sentence eliminates groundwater monitoring for soil alternatives. Given that the arsenic soil concentrations exceed the soil screening level for arsenic by over two orders of magnitude and arsenic has been detected near the MCL in very limited sampling, it is not appropriate to eliminate groundwater monitoring for the soil alternatives. Therefore, EPA believes that long-term groundwater monitoring should be a component of the soil remedies.
- p. 3-11, §3 The discussion of the permeable cover needs to be modified since there appear to be areas where the IC/DEC standards are exceeded at a depth below 2 feet. In these areas a cover (which can be permeable) of at least 2 feet of clean cover material needs to be maintained to meet Remediation Regulation standards for preventing direct contact with the contaminated subsurface soils.
- p. 3-13, §3.3.4 Please correct the last sentence under *Effectiveness*. Areas exceeding industrial PRGs may be co-located with residential exceedances but the opposite is not correct.
- Please edit the discussion of removal to also consider hot spot removal. The discussion should indicate that hot spot removal may be effective if implemented alone or in conjunction with other remedial technologies. The conclusion should be that removal via excavation is retained for consideration as a component of a remedy because hot spot removal may be cost effective.
- p. 3-14, §3.3.5 Please correct the discussion of disposal because it passed the screening evaluation and was only eliminated because excavation was eliminated during the evaluation of the options that passed screening. *See also* EPA's comment below.
- Disposal should be retained based on EPA's recommendation that excavation also be retained. Please edit the text accordingly.
- p. 3-16, §3.3.6 The table needs to include Containment – permeable cover (*see* comment for page 3-11, Section3).
- Please edit the table of representative process options to include long-term groundwater monitoring.
- p. 3-14, §3.4 As discussed in the general comments, please discuss groundwater treatment alternatives as a contingency in case MNA is not viable.
- p. 3-16, §3.4.2 Please correct the last sentence under *Effectiveness*. Natural attenuation may be effective in addressing soluble metals if the result is a change in the groundwater geochemistry that allows the metals to precipitate. Also, this sentence is not consistent with the Monitored Natural Attenuation (MNA) discussion on page 3-17.
- p. 3-18, §3.4.2 Please correct the first sentence in the first full paragraph. Groundwater monitoring would be effective in evaluating MNA.
- p. 3-19, §3.4.3 The discussion under *Effectiveness* states that there is no defined source or plume. This statement cannot be made on the limited characterization to date. A plume may

exist at the oil-water separator and the associated discharge piping. Because the Navy has not demonstrated that groundwater contamination exists throughout DU 5-1, it cannot say that a plume with a defined source does not exist.

p. 3-23, §3.5

Please include another soil alternative that includes hot spot excavation to address exceedances of industrial PRGs because those exceedances may be limited in extent resulting in a more cost effective alternative than a soil cover. Also, add another groundwater alternative that addresses the geochemistry of the groundwater to proactively reduce soluble metals.

p. 3-24, §3.5

Alternatives SO2 and SO3 need to include groundwater monitoring for the reasons stated earlier. In addition, if both of the alternatives leave subsurface soil exceeding IC/DECs below two feet, then each alternative also needs to include requirements to maintain the 2 feet of clean cover and long-term monitoring of the covered contamination. Please modify the descriptions of Alternatives SO2 and SO3 accordingly.

p. 4-1, §4.0

Please edit the text throughout this section to include groundwater monitoring and containment/permeable cover as a components of Alternatives SO2 and SO3.

p. 4-2, §4.1.2

In the first paragraph, the discussion of LUCs needs to be edited to specifically state that the LUCs would be written to prevent access to those portions of the site where the industrial PRGs are exceeded (the text only references fencing and signage).

In the second paragraph, the second sentence needs to be revised to include arsenic that also exceeds the industrial PRG.

Insert text describing how LUCs would be created and maintained in case the Navy transferred the property to another party.

Describe how a two foot cover of clean material will be maintained over contaminated subsurface soil that exceeds IC/DECs.

p. 4-3, §4.1.3

The text needs to be re-written because it does not adequately describe the restrictions required. The introductory paragraph does not mention residential exposures and mischaracterizes the required subsurface restrictions. The first sentence under *Soil Cover* needs to refer to industrial PRGs. Please correct.

Please edit the first sentence in the second paragraph to read: "Soil containing concentrations of manganese and arsenic, down to a two-foot depth, at levels that exceed PRGs"

Revise the entire discussion in the fourth paragraph to clarify the intent. LUCs must prevent residential and unrestricted recreational use of DU 5-1 as well as restrict industrial use. The soil cover is proposed to be protective of industrial users not all receptors. Insert text describing how LUCs would be created and maintained in case the Navy transferred the property.

The discussion of SO3 fails to mention the requirement to add fencing along the eastern perimeter of DU 5-1. This fencing is required to prevent unrestricted recreational use of DU 5-1 because the current fencing does not do that and LUCs

would not clearly be effective. Please edit the discussion accordingly.

Describe how a two foot cover of clean material will be maintained over contaminated subsurface soil that exceeds IC/DECs.p. 4-3, ¶4 Insert text describing how LUCs would be created and maintained in case the Navy transferred the property.

p. 4-4, ¶1 In the first sentence, replace “state regulatory-based remedial objectives” with “ARAR and risk-based remedial standards.”

p. 4-4, ¶6 In the third sentence, change “ARARs” to “chemical-specific ARARs and TBCs.”

p. 4-6, §4.2.2 Regarding the first sentence, please clarify how a LUC will prevent unrestricted recreational use of DU 5-1.

Describe how a two foot cover of clean material will be maintained over contaminated subsurface soil that exceeds IC/DECs.

p. 4-7, §4.2.2 The first sentence in the third full paragraph states that the site would be suitable for continued use similar to the current use. That is neither correct nor consistent with earlier descriptions of this alternative. Restricted recreational use would no longer be allowed under SO2. Please correct.

Please clarify why the penultimate sentence in the third full paragraph qualifies the exposure to ARARs-based PRGs as opposed to all PRGs.

p. 4-7, ¶4 Insert “cover operation and maintenance, long-term monitoring” after “land use controls.”

p. 4-8, §4.2.2 The discount rate for 2012 is 2.0 percent. The 2.3 percent rate was effective for 2011.

p. 4-8, §4.2.3 Unrestricted recreational use will also have to be prevented including LUCs and signs. Without the fence to isolate DU 5-1 it is not clear how enforcement of the unrestricted recreational use would be enforced.

Describe how a two foot cover of clean material will be maintained over contaminated subsurface soil that exceeds IC/DECs.

p. 4-9, §4.2.3 Please fix the first sentence in the second paragraph that states that the site is currently suitable for the current use. Is the intent to state that with SO3 the site would be suitable for the current use?

p. 4-10, §4.2.3 Please delete the duplicate paragraph at the top of the page.

The discount rate for 2012 is 2.0 percent. The 2.7 percent rate was effective for 2010. Please correct.

p. 4-11, §4.2.3 Please correct the missing text in the partial paragraph at the top of the page.

p. 4-11, §4.3 Please correct the last paragraph as no hot-spot soil excavation was proposed.

Describe how a two foot cover of clean material will be maintained, with long-term monitoring, over contaminated subsurface soil that exceeds IC/DECs under alternatives

SO₂ and SO₃.

- p. 5-1, §5.0 As discussed in the general comments, include at least one groundwater treatment alternative as a contingency in case MNA is not viable. Identify how long it will take for the MNA alternative to achieve drinking water standards. The time that MNA alone will take to achieve cleanup standards needs to be compared to the time to meet cleanup standards through an active treatment alternative in order to determine if the MNA only alternative is reasonable.
- p. 5-2, §5.1.2 Please edit the fifth paragraph. If a reduction trend is evident, a reduction in the frequency of monitoring would be appropriate. This would be identified in the long-term monitoring plan. However, for cost estimating purposes this FS assumes one monitoring event every five years after the initial five years of annual monitoring.
- p. 5-3, ¶1 Monitoring parameters listed at the top of the page should also include alkalinity, carbon dioxide, arsenic, temperature, and PAHs. Details of the long-term monitoring will be finalized when the long-term monitoring plan is developed.
- p. 5-3, §5.1.2 In the first full paragraph, please clarify if all groundwater uses need to be prevented. Could groundwater be used for irrigation or to facilitate commercial gardening?
- p. 5-5, §5.2.1 The discount rate for 2012 is 2.0 percent;. The 2.3 percent rate was effective for 2011.
- p. 5-6, ¶3 In the second sentence, insert "MNA and" before "LUCs." Note that GW2 only meets the chemical-specific ARARs/TBCs if MNA can achieve drinking water standards within a reasonable timeframe. The reasonableness of a MNA only alternative should be evaluated in comparison to a treatment alternative.
- p. 5-6, ¶8 See previous comment about adding an additional groundwater RAO to require achieving potable drinking water. Therefore, for RAO 1 (preventing exposure) the RAO can be met after the LUCs are established. However, for RAO 2 it will not be met until the estimated date for MNA to achieve drinking water standards.
- p. 5-7, §5.2.1 The discount rate for 2012 is 2.0 percent. The 2.3 percent rate was effective for 2011.
- p. 5-7, §5.3 An accurate comparison cannot be made until a treatment alternative is added, since there is no way to determine whether the GW2 meets MNA standards.
- Please correct the discussion under *Compliance with ARARs*. In paragraph two, the text states that chemical-specific ARARs would eventually be met but in paragraph three the text states that chemical-specific ARARs are already met because there are no exceedances of MCLs. Also, in the third paragraph please acknowledge that chemical-specific TBCs will have to be achieved before the remedy can be considered complete.
- p. 5-8, §5.3 The paragraph at the top of the page should also state that chemical-specific TBCs would only be achieved by GW2 if MNA can achieve groundwater cleanup standards within a reasonable time period, compared to a treatment alternative. GW1 would not meet chemical-specific TBC standards.
- p. 5-8, §5.3 Under Long-Term Effectiveness and Permanence, please add that it is anticipated that GW2 would eventually return the aquifer to its designated beneficial use as a drinking

water source.

p. 5-8, ¶6	See previous comment about adding a groundwater RAO that will require achieving potable drinking water. Therefore, for RAO 1 (preventing exposure), the RAO can be met after the LUCs are established. However, for RAO 2 it will not be met until the estimated date for MNA to achieve drinking water standards.
Table 2-1, p. 2	For the Action to be Taken text for the RI Remediation Regulations, add a new second sentence: "IC/DEC standards for subsurface soils will be complied with by maintaining a two foot cover of clean material over the contaminated subsurface soil."
Table 2-3	Add the State Solid Waste ARARs that were used for the NUSC and OFFTA RODs to establish standards for the clean cover to be maintained and monitored over contaminated subsurface soils that exceed IC/DECs.
Table 2-4	Please add the risk-based PRGs for ease of comparison to other PRGs, site data, and background. The selected PRGs should also be added, similar to Table 2-6. Footnote 8 needs to be clarified – see comment for page 2-3, Section 2.1.4.1 on subsurface soil depth. Footnotes 5, 6, 7, 8 are not presented so either revise this table or remove these footnotes.
Table 2-6	As discussed on page 2-8, third paragraph, arsenic is not a groundwater COC since detections in groundwater are below MCL. Please revise the table to show that arsenic is no longer a groundwater COC.
Table 2-8	This table indicates that all four soils were included in the calculation of the background concentrations used for selecting PRGs, particularly for arsenic and manganese. However, only two soils, Ne and Pm were historically present at DU 5-1 and Ne soil dominated the area. It appears that the background concentrations would be adequately represented by the Ne values. The background values should be revised accordingly.
Table 3-2	<p>The Table states that an MNA only alternative would not be retained, but that is the only alternative proposed to achieve groundwater standards.</p> <p>The evaluation of <i>in situ</i> chemical oxidation mistakenly states that it would be not be effective for inorganics. Because the conceptual site model assumes that metals have been mobilized by reducing conditions produced by the biological degradation of petroleum products in soil and groundwater, a remedy that returns the groundwater geochemistry to natural conditions could be effective in removing mobilized metals from solution. In addition, it is possible that this alternative would be cost competitive and would achieve the remedial objectives in a much shorter time than MNA. Furthermore, the Navy has not demonstrated that the oil-water separator and associated discharge piping are not the source areas for the petroleum releases and consequently the source of soluble metals. All wells evaluated are located at these potential source areas. Consequently, further characterization is required to prove that the oil-water separator and piping are not source areas or else a proactive <i>in situ</i> remedy needs to be added to this FS to provide an appropriate range of alternatives and to address EPA's guidance on restoring groundwater to beneficial use and guidance on conditions for selecting MNA as a preferred remedy.</p>

Table 3-3	As discussed in previous comments, groundwater monitoring needs to be retained as a component of the soil alternatives to address contamination left in place in soil. Also Containment/Permeable Cover needs to be added to address subsurface soils to be left in place under at least a two foot clean cover. Please add these to this table.
Table 3-4	A proactive treatment remedy to modify groundwater geochemistry needs to be added to the list of retained alternatives because the Navy has not demonstrated that MNA would be an effective remedy.
Table 4-1	Add "long-term monitoring" and "permeable cover" to alternatives SO2 and SO3.
Tables 4-2 & 4-5	The RI Remediation Regulations are "Applicable."
Table 4-5	Change the Action to be Taken text for the RI Remediation Regulations to: "A minimum two foot cover of clean material will be maintained over subsurface soils left on site that exceed industrial commercial direct contact standards. Although additional COCs will remain at concentrations greater than residential numerical soil cleanup standards, the LUCs will prevent exposure to the COCs."
Table 4-6	There are location-specific ARARs for SO2 if monitoring wells, fences, or signs, as well as permeable soil covers will be installed or maintained within floodplain, wetlands, or state buffer zone to wetlands.
Table 4-7	<p>There are action-specific ARARs for SO2 since the installation, sampling, and maintenance of monitoring wells, as well as the installation and maintenance of fences and signs that involve the same ARARs listed in Table 4-10 for SO3. In addition, as documented in Table 2-3, the following action-specific ARAR should be added:</p> <p>Rules and Regulations for Groundwater Quality (Well Standards) – Appendix 1 - Applicable Identifies the standards and specification that must be followed for the installation or abandonment of monitoring wells. Applies to the abandonment of existing monitoring wells.</p> <p>Add the State Solid Waste ARARs that were used for the NUSC and OFFTA RODs to establish standards for the clean cover to be maintained and monitored over contaminated subsurface soils that exceed IC/DECs.</p>
Table 4-8	The RI Remediation Regulations are "Applicable." Change the Action to be Taken text for the RI Remediation Regulations to: "A minimum two foot cover of clean material will be maintained over subsurface soils left on site that exceed industrial commercial direct contact standards. Target Area (hot spot) removal and LUCs will prevent exposure to Site contaminant concentrations exceeding residential standards.
Table 4-10	<p>As documented in Table 2-3, the following action-specific ARAR should be added:</p> <p>Rules and Regulations for Groundwater Quality (Well Standards) – Appendix 1 - Applicable Identifies the standards and specification that must be followed for the installation or abandonment of monitoring wells. Applies to the abandonment of existing monitoring wells.</p>

Add the State Solid Waste ARARs that were used for the NUSC and OFFTA RODs to establish standards for the clean cover to be maintained and monitored over contaminated subsurface soils that exceed IC/DECs. Table 5-1 See previous comments concerning the addition of a treatment alternative.

Table 5-2 Regarding the RI Remediation Regulations, if there is no state standard that is more protective than the federal standards, remove this ARAR. If it is retained, the Regulations are "Applicable."

Table 5-5 For all of the listed chemical-specific ARARs and TBCs, the Action to be Taken text needs to state that each standard will be achieved within a reasonable period of time through MNA. The LUC sentence needs to state that the LUCs are temporary until such time as the groundwater standards are achieved.

Since Table 5-8 states that the Health Advisory for Manganese will not be met by this alternative, it needs to explain that.

Regarding the RI Remediation Regulations, if there is no state standard that is more protective than the federal standards, remove this ARAR. If it is retained, the Regulations are "Applicable."

Table 5-6 There are location-specific ARARs for GW2 if monitoring wells that will be installed or maintained within floodplain, wetlands, or state buffer zone to wetlands (*see* Table 4-9).

Table 5-7 Cite EPA MNA guidance (*see* Table 2-3). To meet this standard the amount of time it will take to achieve drinking water standards through MNA needs to be identified and a determination made that the time period is reasonable as compared to a treatment alternative.

Regarding EPA Groundwater Guidance. Replace in the last sentence of the Action to be Taken, replace "application of the Land Use Controls (LUCs)" with "MNA within XX years. LUCs will be maintained to prevent groundwater use until groundwater cleanup standards are achieved."

Add the State Clean Air Act standards and Sediment and Erosion Control Guidance from Table 2-3 pertaining to the installation and maintenance of the monitoring wells for this alternative.

Table 5-8 If footnote a is accurate, then GW2 does not meet the ARAR. It also may not meet the ARAR criteria if MNA cannot achieve groundwater cleanup standards within a reasonable period of time.

As previously commented by EPA, please specify how long MNA will take to achieve drinking water standards (*i.e.*, citing > 30 years is not sufficient).

Figure 1-4 Please show the existing fence lines at the perimeter of DU 5-1 on this figure.

References On page R-5, please update the reference to the RSLs to show the most recent revision date (currently May 2012).

Appendix A-3 Figure 3 should include human receptor exposure to subsurface soil.

The removal date for the OWS was not 2002, it was during the 2004-2006 supplemental investigation and removal action. Please correct.

Appendix A-5 Figure 2 presents the concentrations of metals in groundwater at and upgradient of DU 5-1. The conceptual site model states that petroleum releases at the upgradient tank farm have created reducing conditions that have migrated downgradient to DU 5-1 causing and or facilitating the mobilization of metals. The data presented in Figure 2 show that the metals concentrations in several of the downgradient wells located in DU 5-1 are significantly greater than the metals concentrations at the upgradient tank farm. This strongly suggests, as a minimum, that additional releases have occurred within DU 5-1 as a result of activities conducted within DU 5-1. While it is possible that some contribution to the mobilization of metals could be attributed to releases from the upgradient tank farm tanks, the Navy has not provided adequate information to demonstrate that that is occurring or the significance of the impact. Additional data will be required to support the conceptual site model.

Appendix B On page 2, the third paragraph states that at Tank Farm 5 only manganese was retained as a COC for soil. This Draft Final FS also retained arsenic as a soil COC. Also, exposure to soil and groundwater is of concern for future residents. Please correct.

On page 4, Section 2.2, the text states that four soil types were combined to calculate average soil background values. Because only two soil types (Ne and Pm) are present at DU 5-1, and Ne dominates, the background values presented for use at DU 5-1 are not appropriate. It appears that the background concentrations would be adequately represented by the Ne values. The background values should be revised.

Table 6-38 (should apparently be numbered as Table 2) is obsolete and needs to be updated to reflect the information presented in this Draft Final FS.

Appendix C page 2 of 4: Under Pre-design Investigation two line items apparently refer to preparation of the report; one for \$6,300 and one for \$3,400. Please correct.

page 2 of 4: The Navy is proposing the collection of ten soil samples for the pre-design investigation. It appears that at each location the Navy will have to collect a surface soil sample to confirm whether contamination exists at the surface. If contamination does not exist at the surface, the Navy will need to determine at what depth contamination exists, down to two feet. If contamination does exist at the surface, the Navy will need to step out and resample. It is not clear how the Navy can adequately define the soil cover area with only ten samples.

page 2 of 4: A drilling subcontractor is included for three days, but soil sampling will only be required in the 0-2 foot interval to define the limits of contamination for industrial exposure. Please clarify why a driller is required and if used why are three days required for ten samples? Similarly, why are eight 10-hour days required to collect ten surface or shallow soil samples?

Table C1-6: the discount rate for 2012 is 2.0% for 30 years. The 2.3% rate was effective for 2011 estimates. Please update.

Table C1-9: the discount rate for 2012 is 2.0% for 30 years. The 2.3% rate was effective for 2011 estimates. Please update.

Table C2-2: the discount rate for 2012 is 2.0% for 30 years. The 2.3% rate was effective for 2011 estimates. Please update.

Table C2-6: the discount rate for 2012 is 2.0% for 30 years. The 2.3% rate was effective for 2011 estimates. Please update.